RECENT ADDITIONS TO THE WEATHER BUREAU LIBRARY.

By Mr. H. H. KIMBALL, Librarian.

The following titles have been selected from among the books recently received, as representing those most likely to be useful to Weather Bureau officials in their meteorological work and studies. Most of them can be loaned for a limited time to officials and employees who make application for them.

Brennecke, Wilhelm. Beziehungen zwischen der Luftdruckverteilung und den Eisverhältnissen des Ostgrönländischen Meeres. 18 pp. 4°. Berlin. 1904.

Clerk, Agnes M. Problems in astrophysics. XVI, 567 pp. 8°. London. 1903.

Czermak, Paul. Ueber elektricitätszerstreuung in der Atmosphäre. (Besonders Abgedruckt aus dem LXXIV Bande der Denkschriften der mathematisch-naturwissenschaftlichen Classe der kaiserlichen Akademie der Wissenschaften). 33 pp. 4°. Wien. 1903.

Dexter, Edwin Grant. Weather influences. With introduction by Cleveland Abbe. XXXI, 286 pp. 8°. New York. 1904.

Dutton, Clarence Edward. Earthquakes in the light of the new seismology. (23), 314 pp. 8°. London. 1904.

Elias, Hermann. Der Gang der meteorologischen Elemente im Nebel. 10 pp. 4°. Berlin. 1903.

Ebermeyer. Untersuchungen über den Einfluss des Waldes auf den Grundwasserstand. Bearbeitet von Ebermayer und Otto Hartmann. (Separat-Abdruck Jahrgang 1903.) 17 pp. 4°. München. 1904.

Hahn, R. Das Wetter, die Winde und die Strömungen der Meere. 48 pp. 4°. Hamburg. 1904.

Hering, Carl. Ready reference tables. Vol. 1. 196 pp. 16°. New York. 1904.

Herrmann, E. Wetterprognosen für den Ozean und ihre Bedeutung für die Schiffahrt. 24 pp. 8°. Hamburg. 1904.

International Kommission für wissenschaftliche. Beobachtungen mit bemannten, unbemannten Ballons und Drachen sowie auf Berg-und Wolkenstationen. Juni 1901 6 August 1903. Herausgeben von Prof. Dr. H. Hergesell. (Veröffentlichungen der Internationalen Kommission für wissenschaftliche Luftschiffahrt.) 211 pp. 4°. Strassburg. 1904.

Kayser, H. Handbuch der Spectroscopie. Zwei Bände. XXIV, 781; XI, 696 pp. 8°. Leipzig. 1902.

Keller, Hermann. Die Hochwassererscheinungen in den deutschen Strömen. VIII, 104 pp. 4°. Jena. 1904.

Keller, Konrad. Die Atmosphäre ein elektro-pneumatischer Motor. 102 pp. 8°. Zürich. 1903.

Kelvin, Lord. Baltimore lectures on molecular dynamics and wave theory of light. (21), 694 pp. 8°. London. 1904.

Klimpert, R. Entstehung und Entladung der Gewitter, sowie ihre Zerstreuung durch den "Blitzkamm" (Fulgura frango). VIII, 203 pp. 12°. Bremerhaven. 1902.

Kommission für luftelektrische Forschungen. Denkschrift der Kommission für luftelektrische Forschungen nebt Berichten über die Tätigkeit der luftelektrischen Stationen. (Separat-Abdruck aus den Sitzungsberichten der mathem.—phys. Klasse der Kgl. Bayer. Akademie der Wissenschaften. Bd. XXXIII 1903 Heft II.) Pp. 257–379.

L. Chatelier, H. and Boudard, O. High-temperature measurements. Authorized translation and additions by G. K. Burgess. 2d ed. (15), 341 pp. 12°. New York. 1904.

Lehmann, — Das Klima des Herzogtumas Sachsen-Meiningen. (Sonderabdruck aus Heft 44 der Schriften des Vereins für Meiningische Geschichte und Landeskunde.) Pp. 495–526. 8°. Hildburghausen. 1903.

Mangels, H. Wirtschaftliche, naturgeschichtliche und klimatologische Abhandlungen aus Paraguay. VIII, 364 pp. 8°. München. 1904.

McClelland, J. A. Ionization in atmospherie air. (Scientific transactions of the Royal Dublin Society. Vol. 8. (Ser. II.) Pp. 57–64.

Merriman, Mansfield and Woodward, Robert S. Higher mathmetics. XI, 576 pp. 8°. New York. 1902.

Nippoldt, A., Jun. Erdmagnetismus, Erdstrom and Polarlicht. 136 pp. 24°. Leipzig. 1903.

Pernter, J. M. Jelineks Psychrometer-Tafeln erweitert und vermehrt von J. Hann neu herausgegeben und mit Hygrometer-Tafeln versehen von J. M. M. Pernter. 5 ed. XIII, 107 pp. 4°. Leipzig. 1903.

Pernter, J. M. Meteorologische Optik. Zweiter Abschnitt. 55–212 pp.

Pietzmann, Gustav. Die Beobachtuneen der Lufttemperatur während der totalen Sonnenfinsterniss vom 22. Januar, 1898 in India. (Nova acta. Abh. der Kaiserl. Leop.—Carol. Deutschen Akademie der Naturforscher. Band LXXXI. Nr. 6.) Pp. 307–378.

Quervain, Alfred de. Die Hebung der atmosphärischen Isothermen in den schweizer Alpen und ihre Beziehung zu den Höhengrenzen (Sonderabdruck aus Gerlands Beiträgen zur Geophysik. Bd. 6, Heft 4.) (8), 53 pp. 8°. Leipzig. 1903.

Rayet, G. Note historique sur la Commission Météorologique de la Gironde et sur ses travaux. 24 pp. 8°. Bordeaux. 1903.

Rid, Hans. Klimalehre der alten Griechen nach den geographica Strabos. 62 pp. 8°. Kaiserlautern.

Rubel, Otto. Das Klima der Stadt Heidelberg in den Jahren 1886 bezw. 1888–1900. (Sonderabdruck aus Gerlands Beiträgen zurGeophysik. Bd. 6, Heft 1.) Pp. 170–237. 8°. n.t.p.

Rudolph, H. Lufteletrizität und Sonnenstrahlung. 24 pp. 8°. Leipzig. 1903.

Rutherford, E. Radio-activity. 8°. (8), 399 pp. Cambridge. 1904.

Schubert, Johannes. Der Wärmeaustausch im festen Erdboden, in Gewässern und in der Atmosphäre. 30 pp. 8°. Berlin. 1904.

Schürmann, Karl. Beiträge zur Kenntnis der monatlichen Drehung der Winde nach 16 jährigen Beobachtungen der meteorologischen Stationen in: Wilhelmshaven, Hamburg, Kiel, Berlin, Wustrow, Neufahrwasser, Memel. 23 pp. 8°. Rostock. 1903.

Sverdrup, Otto. New land. Four years in Arctic regions. Translated from the Norwegian by Ethel Harriet Hearn. In two volumes. XVI, 496; XII, 505 pp. 8°. London. 1904.

Thevenet. Recherches de thermodynamique sur la distribution des éléments météorologiques a l'intérieur des masses d'air en mouvement. X, 94 pp. 4°. Alger. 1903.

Vanhove, D. Étude pluviométrique sur le bassin de la Meuse. (Mémoires couronnés et mémoires des savants étrangers publié par l'Académie Royale des sciences, des lettres et des beaux-arts de Belgique. Tome XLII. 16 fasc.). 30 pp.

Voss, Ernst Ludwig. Beiträge zur Klimatologie der südlichen Staaten von Brasilien. IV, 48 pp. 4°. Gotha. 1904.

Weber, L. Wind und Wetter. 130 pp. 12°. Leipzig. 1904.

Wiebe. Tafeln über die Spannkraft des Wasserdampfes. Berechnet und herausgegeben von Dr. H. F. Wiebe. IX, 30 pp. 8°. Braunschweig. 1903. 2 ed.

THE NEW "METEOROLOGIA" BY A. I. WOEIKOF.

By STANISLAV HANZLIK, Ph. D. Dated January 15, 1905.

To the series of treatises on meteorology written by scientists of different nations and culminating in Hann's Lehrbuch is now to be added this newest work by the well-known Russian authority, Professor Woeikof, of the University of St. Petersburg. This work of 719 pages, in 30 chapters, was published in four parts during the year 1904, but, unfortunately for American readers, it is in the Russian language. We give the titles of the chapters, hoping that some one will publish a complete English translation.

In the preface the author explains the reasons that led him to write a new work on meteorology, namely, that the treatise by Kaemtz, long ago translated into Russian by Professor Spassky, is to-day out of print and antiquated. The idea of translating Hann into Russian was abandoned because every meteorologist reads the German language. Still there is need of a Russian handbook for the use of those who are interested in meteorology in general, and especially for the young students, who at the beginning of their studies can not be familiar with the terms and the literature of this special subject. Woeikof has written his book for those who have only an elementary knowledge of physics and mathematics.

In the first part he explains the general scope of the science and the methods employed, Lambert's and Bessel's formulæ, graphic methods of illustration, etc. He then passes on to the laws of gases and the composition, mass, and altitude of the atmosphere.

In the chapters on radiation and actinometry he speaks of the source and the measurement of radiant heat; gives the details of the Violle-Savelieff actinometer and of the measurements made in Kief and Ekaterinburg; the distribution of energy in the spectrum and its selective absorption by aqueous vapor and by carbonic acid gas.

In chapter 6 the author enters into the largest part of his work, namely the distribution of temperature in the deep earth, the surface soil, and oceans and lakes, to all of which he devotes 151 pages. The reason for treating this subject in such elaborate detail is stated in the introduction, i. e., that so many investigations in this field have been made in Russia (see, for instance, Woeikof's reports in the Meteorologische Zeitschrift, 1903, p. 451), and also because the memoirs on this subject are scattered through different kinds of publications, and he wishes to bring them all together here.

In the chapters on the temperature of the water he includes rivers, lakes, and seas, and gives a résumé of the numerous works done since the publication of the oceanographies of Boguslawski, Krümmel, and Thoulet. He mentions here a new, large volume by Professor Spyndler.

Chapters 6, 7, and 8 give the distribution of temperature in the earth's crust, having regard, first, to the surface layer of the crust; the arrangement employed for investigation; the daily and yearly gain and loss of heat; the influence of underground waters, rainfall, foliage of plants, etc.

Chapters 9 and 10 treat of the temperatures observed in oceans, lakes, and smaller bodies, mentioning the influence of winds. He gives the yearly curve and the types of temperature distribution. The distribution of salinity, surface temperatures, and currents in the great oceans is discussed, and the influence of shape and size of the ocean bed on the direction and velocity of the current is also considered.

Chapter 11 treats of the snow, ice, and icebergs.

Chapter 12 explains the temperature and humidity of the air (Assmann's ventilated psychrometer, maximum and minimum thermometers, Saussure's hygrometer, Wilds evaporimeter), and the evaporation of sea water.

Chapters 12 and 13 deal with the thermodynamics of the atmosphere, especially as illustrated by the results of the balloon work at Berlin and the theoretical investigations of von Bezold on the successive stages in the condition of an ascending current of moist air.

Chapters 14 and 15 treat of the vertical and horizontal distribution of the average temperature and humidity and their periodic and nonperiodic changes.

Chapter 16; the cloudiness and especially the kind of clouds.

Chapter 17; rain, snow, and hail.

Chapter 18; the study of atmospheric pressure, the instruments, the changes of pressure with time, diurnal periods, isobars, the reduction to sea level.

Chapters 19 and 20; the anemometer, the velocity of the wind, the Koeppen-Espy theory as to the diurnal periodicity of the upper and lower winds, the relation between pressure and wind, barometric gradients, etc.

Chapter 21; the general circulation of the air between the poles and the equator.

Chapter 22; the influence of the continents on the winds, the monsoons, and other local winds.

Chapter 23; the optical phenomena of the atmosphere.

Chapter 24; atmospheric electricity, its measurement, with especial reference to the new theories of ions of Arrhenius, Ekholm, and others.

Chapters 25, 26, and 27 treat of cyclonic storms and chapter 28 of thunderstorms.

Chapter 29 is devoted to climate. The treatise closes with chapter 30, describing the national meteorological bureaus, forecasts, observing stations, the hours of observation, and the international meteorological congresses.

The work is richly illustrated with diagrams and pictures, such as are used by Woeikof in his lectures at the university. At the end of each chapter Woeikof adds references to the literature of the respective subjects. The whole work is well adapted to the use of students in universities.

THE RESULTS OF THE WORK DONE AT THE AERONAUTICAL OBSERVATORY AT TEGEL, NEAR BERLIN, FROM OCTOBER 1, 1901, TO DECEMBER 31, 1902.[1]

By STANISLAV HANZLIK, Ph. D.

This second official publication of the Aeronautical Observatory near Berlin relates to fifteen months of work with kites, kite balloons, free manned and free sounding balloons. This report differs from the first in that the authors have abandoned the complete reproduction of all original curves and daily weather maps, which were formerly given with the view to the possibility of the practical application of aerial exploration to the daily work of forecasting.

Many troubles occurred after the military aeronautical battalion began its full service at the end of the year 1901. This battalion is quartered across the road just opposite the observatory at Tegel, and it often happened that the wires of the kite, when flying in the air, interfered with the lines of the kite balloons of the military battalion. Therefore the plan of flying the kites from the top of the kite tower built for this purpose was abandoned and, by means of a pulley, the kite wire was led from the reel in an opposite direction along the ground away from the observatory. Another disadvantage due to proximity to the city was experienced when the kite wires broke and fell on telephone wires or on lines conducting currents of high potential, causing many disagreeable and dangerous accidents, both in Berlin and the adjacent suburbs. For these reasons it has now been decided to remove this observatory still farther from Berlin, and a new location has been chosen in Lindenberg, 60 kilometers southeast of Berlin, where it is expected that a new series of ascensions will begin in April, 1905.

As regards the kites, as indeed I had occasion to see during my stay at Tegel, all kinds have been built and tried, not only the patterns proposed by members of this observatory, but those by other meteorologists in all parts of the world, and the balloon house at Tegel is a real museum of kites exhibiting the greatest variety of shapes and sizes. The observatory employs a carpenter, whose entire time is given to building and mending the kites. A wide experience with many patterns has shown that the great Hargrave kite, with curved front surfaces devised by Mr. Clayton of Blue Hill, is the best. For light winds kites of seven square meters of surface are used, but for the strongest winds those of six, four, or three square meters are used. For the very lightest winds, a delicate kite of aluminum tubes covered with silk, devised by Assmann, has been successfully flown. Recently the X kites devised by the assistant of the observatory, Mr. Mund, have been used. They are of the Hargrave pattern, but easily fold up flat for convenience of transportation, and are used therefore as auxiliary for holding up the kite line. The advantage of folding up is apparent when the kites in high winds tear away or are automatically released and carried far away.

As regards kite balloons, it is found that when they are frequently used the balloon fabric becomes useless within a half year, making them very expensive when we recall that a kite balloon of 68 cubic meters capacity costs 1300 marks.

As regards the self-registering instruments, Professor Marvin's kite meteorograph proved to be a satisfactory working instrument up to the height of 2500 meters for which it was designed; but a considerable correction must be applied if one wishes to use it at higher elevations. In fact, the first great height attained at Tegel, December 6, 1902, as computed from the original barograph curves, gave 5475 meters, but a subsequent very careful investigation reduced this height to 4820 meters. The sharpness of the curves given by the Marvin meteorograph is injured by the oscillations of the kite, unavoidable in strong winds, but the curves were much improved by an arrangement devised by Doctor Elias, who fastened the meteorograph by springs to the front cell of the kite, thus shielding it from shocks and vibrations. Marvin's electrically-registering anemograph worked with much uncertainty and often entirely stopped. Moreover, being exposed on top of the kites, it was often injured and the friction coefficient changed thereby. For this reason some columns given in the present volume are left entirely blank as to the wind velocity. As an improvement, Professor Assmann has applied the Woltmann vanes (like the vanes of an electric fan). The

[1] Ergebnisse der Arbeiten am Aeronautischen Observatorium, October 1, 1891, bis December 31, 1902, von R. Assmann u. A. Berson.